Amendments to the Specification

Please amend the following paragraph on page 5 (paragraph [0013] in Application No. 20030033264):

FIGS. 2a-2b illustrate crossover operations which are ~~may be~~ used to generate a child organism from a pair of parent organisms when evolving the graph structure;

Please amend the following paragraphs that begin on page 6 (paragraphs [0015], [0017], [0018], and [0019] in Application No. 20030033264):

FIG. 1 shows a method for designing a graph structure which incorporates the present teachings. At step 100, an arrangement of nodes and arcs for the graph structure is determined. Any one or more of a variety of known techniques are ~~may be~~ employed at step 100 including designs by hand and automated methods.

At step 104, the graph structure is evolved using the genome representation obtained at step 102. Step 104 is ~~may be~~ performed using any one or more of a variety of known genetic programming techniques.

FIGS. 2a-2b illustrate crossover operations which are ~~may be~~ used at step 104 to generate a child organism from a pair of parent organisms when evolving the graph structure 200. In this example, the parent and child organism each have genetic material made up of a sequence of bits. Alternatively, the genetic material of an organism is ~~may be~~ a sequence of numbers.

FIG. 2a shows a one-point crossover operation 20 which combines a parent organism 30 with a parent organism 32 to yield a child organism 34. The one-point crossover operation 20 combines a sequence of genetic material 10010 from the parent organism 30 as a prefix with a sequence of genetic material 00100 from the parent organism 32 as a suffix to yield a sequence of genetic material 1001000100 in the child

organism 34. The crossover point in this example is between the fifth locus and sixth locus of the sequence but in general may be located anywhere in the sequence. The locus of crossover is ~~may be~~ randomly chosen each time.

Please amend the following paragraph on page 7 (paragraph [0020] in Application No. 20030033264):

FIG. 2b shows a two-point crossover operation 22 which combines a sequence of genetic material 100-----10 from the parent organism 30 with a sequence of genetic material 11001 from the parent organism 32 to yield a sequence of genetic material 1001100110 in the child organism 34. The crossover points in this example are between the third locus and fourth locus of the sequence and between the eighth locus and ninth locus of the sequence but in general are ~~may be~~ located at any two positions in the sequence.

Please amend the following paragraphs that begin on page 12 (paragraphs [0038] and [0040] in Application No. 20030033264):

This linear sequence of weights provided by the optimized genome representation is ~~may be~~ translated into a data structure representing the graph structure 200 in several ways. For example, the internal representation of the graph data structure ~~may~~ contains the appropriate index into the genome representation either directly or through a table indexed by an inherent link index. Whenever a weight is needed, this index is used to extract the correct number from the genome representation. In another example, a table ~~may~~ maps the index in genome-order to the intrinsic index in the graph data structure. Before the graph structure is evaluated, this table is traversed and the weights from the genome are patched into the data structure.

A variety of hardware systems including general purpose computer systems and specialized systems are ~~may be~~ employed to automatically design a desired structure by deriving a genome representation according to the present teachings. The present

techniques decrease the computational time on the hardware system employed to automatically determine the genome representation and automatically evolve the weights.